REPORT OF INDUSTRIAL HYGIENE SURVEY

ANACONDA ALUMINUM COMPANY

COLUMBIA FALLS, MONTANA

SURVEY DATES:

October 4-8, 1971

Participants

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16. Abstract (Limit: 200 words)

The results of airborne contaminant measurements taken at the Anaconda Aluminum Company (SIC-3341) in Columbia Falls, Montana, on October 4 to 8, 1971, are tabulated. Concentrations of benzene soluble materials in area and personal samples are presented, along with total particulate measurements. Fluoride concentrations in air and in urine samples from the workers are included, and noise level measurements at selected sites are provided.

17. Document Analysis a. Descriptors

Field-Study, Region-8, Health-survey, Industrial-hygiene, Airborne-contaminants, Air-sampling, Metal-workers, Chemical-exposure, Noise-levels, Dust-exposure

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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TABLE 1A

AIR CONCENTRATIONS OF BENZENE SOLUBLE MATERIAL (AREA SAMPLES)

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 of Benzene Soluble Material
6233	A	High Volume*	53.7	High Volume - Line No. 1, Near Pot 148 on Sidewall - 8:18 A.M. to 3:20 P.M. 10/5/71	0.36
6234	B	High Volume	27.5	High Volume - Line No. 1, Near Pot 148 on Sidewall - 8:58 to 2:06 P.M. 10/6/71	3.68
6235	C	High Volume	42.1	High Volume Line No. 1, Near Pot 148 on Sidewall - 8:43 to 2:41 P.M. 10/7/71	0.32
6236	D	High Volume	34.6	High Volume - Line No. 1, Near Pot 148 on Sidewall - 3:24 to 7:55 P.M. 10/7/71	0.25
6237	E	High Volume	44.5	High Volume - Line No. 1, Near Pot 148 on Sidewall - 8:24 to 2:47 P.M. 10/8/71	0.66

* Samples were collected on 4" glass fiber filters by William Wagner and Lee Larsen of NIOSH.

TABLE 1B

AIR CONCENTRATIONS OF BENZENE SOLUBLE MATERIAL (AREA SAMPLES)

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 of Benzene Soluble Material
6304	02956	Glass Fiber*	153	Cathode Rebuild Room	
				High Volume - 9:22 A.M. to 11:12 A.M. 10/8/71	0.70
6305	02957	"	278	Room 8 - North Section - West Wall	
				High Volume - 4:35 to 7:55 P.M. 10/7/71	0.36
6306	02958	"	174	Cathode Repair Room	
				High Volume - 2:10 to 4:10 P.M. 10/7/71	0.19
6307	02959	"	273	Anode Rebuild Room	
				High Volume - 10:08 to 1:52 P.M. 10/7/71	0.60
6308	02960	"	196	Anode Rebuild Area	
				High Volume - 11:15 to 2:10 P.M. 10/6/71	0.50
6309	02961	"	127.5	Room 7 - Center Section - Potline Area	
				High Volume - 9:20 to 11:00 A.M. 10/6/71	0.35

*Samples were collected on 8 x 10 glass fiber filters by Ed Gatzemeier of the Montana State Health Department.

TABLE 1C

AIR CONCENTRATIONS OF BENZENE SOLUBLE MATERIAL (PERSONNEL SAMPLES)

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 of Benzene Soluble Material
6342	39	Silver Membranes	.456	Composite of 4 samples.	
	6	"	.362	Ore Truck Driver*	
	45	"	.326		
	1	"	.240	Composite Air Volume = 1.384 M^3	3.1
6343	50	"	.432	Composite of 6 samples.-	
	44	"	.410	Pin Pullers Working on	
	7	"	.408	Swing Shift 10/7/71*	
	25	"	.404		
	35	"	.404		
	10	"	.406	Composite Volume = 2.464 M^3	2.0
6344	98	"	.347	Composite of 5 samples	
	87	"	.318	Jack Slipper*	
	59	"	.378		
	89	"	.406		
	2	"	.410	Composite Air Volume = 1.859 M^3	1.3

TABLE 1C - Continued

AIR CONCENTRATIONS OF BENZENE SOLUBLE MATERIAL (PERSONNEL SAMPLES)

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 of Benzene Soluble Material
6345	32		.256	Composite of 2 samples	
	22		.252	Pot Reline*	
				Composite Volume = .508 M^3	2.8
6346	23		.428	Composite of 5 samples	
	36		.332	Potmen*	
	11		.674		
	27		.928		
	37		.825	Composite Volume = 3.187 M^3	0.3
6347	29		.450	Utilityman*	
	17		.386		
	38		.504	Composite Air Volume = 1.340 M^3	0.5
--	83			Scaleman (Insufficient samples)	--

TABLE 1C - Continued

AIR CONCENTRATIONS OF BENZENE SOLUBLE MATERIAL (PERSONNEL SAMPLES)

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 of Benzene Soluble Material
6348	33		.683	Crane Transfer Bay - Composite of two samples (Area Sample)*	
	4		.944	Composite Volume = 1.627 M^3	1.9
---	72		---	Discarded - Flow down	
6349	26		.460	Tapper*	0.2

TABLE 1C - Continued

AIR CONCENTRATIONS OF BENZENE SOLUBLE MATERIAL (PERSONNEL SAMPLES)

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 of Benzene Soluble Material
6350	47		.480	Pin-Puller Composite of 13 Samples*	
	30*		.344		
	5		.358		
	20		.346		
	54		.356		
	58		.346		
	67		.326	Composite Volume = 4.822 M^3	2.9
	63		.308		
	53		.378		
	51		.430		
	65		.384		
	55		.370		
	40		.396		

*Refer to Table 1D for Sampling Periods.

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
51	Silver Membrane	.430	Pin Puller Room No. 4	1.0	2.33
			No. 2 Pot Line - 8:55 A.M. to 12:30 P.M. 10/5/71		
65	"	.384	Pin Puller - Room No. 4	1.2	3.12
			Pot Line No. 2 - 9:00 A.M. to 12:17 P.M. 10/5/71		
59	"	.378	Jack Slipper - Pot Line No. 2	1.7	4.49
			9:08 A.M. to 12:18 P.M. 10/5/71		
89	"	.406	Jack Slipper	0.3	0.74
			Pot Line No. 2 - 9:12 A.M. to 12:35 P.M. 10/5/71		
55	"	.370	Pin Puller - Room No. 6	11.6	31.90
			9:15 to 12:20 P.M. 10/5/71		
98	"	.347	Jack Slipper - Pot Line No. 1	4.6	13.26
			Room No. 2 - 9:12 to 12:25 P.M. 10/6/71		
87	"	.318	Jack Slipper - Pot Line No. 1	1.4	4.40
			Room No. 2 - 9:18 to 12:25 P.M. 10/6/71		

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
54	Silver Membrane	.356	Pin Puller - Room No. 2	3.8	10.67
			9:22 to 12:20 P.M. 10/6/71		
58	"	.346	Pin Puller - Room No. 2	0.3	0.87
			9:27 to 12:20 P.M. 10/6/71		
67	"	.326	Pin Puller	3.8	11.65
			Room No. 8 - 9:35 to 12:18 P.M. 10/6/71		
63	"	.308	Pin Puller - Pot Line No. 4	0.6	1.95
			9:44 to 12:18 P.M. 10/6/71		
53	"	.378	Pin Puller - Room No. 6 Line 3	18.7	49.47
			9:18 to 12:27 P.M. 10/5/71		
33	"		Scaleman (Insufficient Sample)		
			9:34 to 12:32 P.M. 10/5/71		
72	"	.440	Crane Bay Area - Top of Working Crane (Area Sample)	0.5	1.14
			9:47 to 1:27 P.M. 10/5/71 (flow down)		
61	"	--	Blank Ag Membrane Filter	0.03	--

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
70	Silver Membrane	.256	Area Sample - South side of Anode Rebuild	0.2	0.78
			10:20 to 12:28 P.M. 10/7/71		
27	"	.928	Potman - Room 3 Line 2	2.0	2.15
			8:54 A.M. to 1:27 P.M. 10/7/71		
47	"	.480	Pin Puller Room 3 Line 2	3.7	7.71
			9:02 to 1:02 P.M. 10/7/71		
1	"	.240	Fluoride Trucker (Charges Pots)	0.5	2.08
			9:10 to 11:10 A.M. 10/7/71		
38	"	.504	Utilityman (Sweeper) Room 3 and 4 - 9:15 to	1.8	3.57
			1:26 P.M. 10/7/71		
37	"	.825	Potman - Room 5	2.7	3.27
			9:28 to 2:22 P.M. 10/7/71		
30	"	.344	Pin Puller - Room 7	2.4	6.98
			9:38 to 12:30 P.M. 10/7/71		

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
4	Silver Membrane	.944	Top of Transfer Crane (Area Sample)	2.8	2.97
			9:37 to 2:42 P.M. 10/8/71		
50	"	.432	Pin Puller, Room 4	5.3	12.27
			4:39 to 8:15 P.M. 10/7/71		
44	"	.410	Pin Puller	1.0	2.44
			4:45 P.M. to 8:10 P.M. 10/7/71		
7	"	.408	Pin Puller, Room 7	0.8	1.96
			4:53 to 8:17 P.M. 10/7/71		
25	"	.404	Pin Puller, Room 7	5.0	14.68
			4:58 P.M. to 8:20 P.M. 10/7/71		
35	"	.404	Pin Puller, Room 9	0.2	0.50
			5:01 P.M. to 8:23 P.M. 10/7/71		
10	"	.406	Pin Puller, Room No. 9	0.6	1.22
			5:03 to 8:26 P.M. 10/7/71		

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
40	Silver Membrane	.396	Pin Puller, Room 7	2.3	5.81
			9:40 to 12:58 P.M. 10/7/71		
23	"	.428	Potman - Room 7 North	0.4	0.93
			9:44 to 1:18 P.M. 10/7/71		
39	"	.456	Ore Truck Driver	0.9	1.97
			9:47 to 1:47 P.M. 10/7/71		
26	"	.460	Tapper - Room 7	0.6	1.30
			9:50 to 1:40 P.M. 10/7/71		
33	"	.683	(Area Sample) Crane Transfer Bay - Top of Transfer Crane	1.9	2.78
			10:12 to 2:16 P.M. 10/7/71		
36	"	.332	Potman	0.7	2.11
			10:20 A.M. to 1:06 P.M. 10/7/71		
11	"	.674	Potman Room 10	1.1	1.63
			8:57 to 2:34 P.M. 10/8/71		

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
17	Silver Membrane	.386	Uyilityman - Line 5		
	"		8:56 - 12:09 P.M. 10/8/71	2.2	5.70
15	"	--	Discarded (Worker turned off pump)		
			Area sample - lunch room.		
5	"	.358	Pin Puller - Room 5		
			9:05 - 12:04 10/8/71	0.7	1.96
20	"	.346	Pin Puller		
			9:09 - 12:02 P.M. 10/8/71	7.1	20.52
6	"	.362	Ore Trucker		
			9:15 A.M. - 12:16 P.M.	1.4	3.87
45	"	.326	Ore Trucker - Room 7 and 8		
			9:28 - 12:11 P.M. 10/8/71	2.4	7.36
29	"	.450	Utilityman - Line 1 - Room 1 and 2		
			8:25 - 12:10 P.M. 10/8/71	1.6	3.55

TABLE 1D

TOTAL PARTICULATE

Field Number	Type of Sample	M^3 Sample Volume	Description	Sample Weight Mg	Gross Weight Mg/M^3
2	Silver Membrane	.410	Jack Slipper - Room 1		
			8:30 - 11:55 A.M. 10/8/71	0.6	1.46
34	"	.206	Jack Slipper		
			8:32 - 10:15 A.M.	Sample Discarded	
32	"	.256	Pot reline		
			8:42 - 10:54 A.M. 10/8/71	0.5	1.95
22	"	.252	Pot reline		
			8:43 - 10:54 10/8/71	0.7	2.78
18	"	1.146	(Pump stopped - sample discarded)		

TABLE 2

AIR CONCENTRATIONS OF FLUORIDE

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 Fluoride
[illegible]	MF24	MF	.513	Potman - Room 7 Center 10:55 - 3:25 P.M. 10/5/71	0.116
[illegible]	24	MI	.513	Potman - Room 7 Center 10:55 - 3:25 P.M. 10/5/71	0.094
				Total Fluoride	0.2
[illegible]	MF17	MF	.372	Potman - Room 7 Center 9:30 - 12:05 P.M. 10/6/71	0.349
[illegible]	C-3	MI	.372	Potman - Room 7 Center 9:30 - 12:05 P.M. 10/6/71	0.032
				Total Fluoride	0.4
[illegible]	MF19	MF	.250	Area sample - South Side Anode Rebuild	0.280
[illegible]	69	MI	.250	10:17 - 12:28 10/6/71	0.036
				Total Fluoride	0.3
[illegible]	MF15	MF	.515	Potman - Center Room No. 5 11:00 - 3:30 P.M. 10/5/71	0.213
[illegible]	33	MI	.515	Potman - Center Room No. 5 11:00 - 3:30 P.M. 10/5/71	0.112
				Total Fluoride	0.3
[illegible]	MF13	MF	.314	Potman - Center Room No. 5 8:15 - 11:00 A.M. 10/5/71	0.318
[illegible]	44	MI	.314	Potman - Center Room No. 5 8:15 - 11:00 A.M. 10/5/71	0.146
				Total Fluoride	0.5

TABLE 2 - Continued

AIR CONCENTRATIONS OF FLUORIDE

Laboratory Number	Field Number	Type of Sample	M^3 Sample Volume	Description	Mg/M^3 Fluoride
265	MF21	MF	.350	Potman - 9:00 - 12:05 10/6/71	0.086
256	15	MI	.350	Potman - 9:00 - 12:05 10/6/71	0.020
				Total Fluoride	0.1
267	MF18	MF	.285	Potman - Room 7 Center 8:25 - 10:55 A.M. 10/5/71	0.246
261	32	MI	.285	Potman - Room 7 Center 8:25 - 10:55 A.M. 10/5/71	0.109
				Total Fluoride	0.4

FLOURIDE ANALYSES OF URINE (SAMPLES OBTAINED DURING OCTOBER 1971)

LAB #	FIELD #	MG. F/L URINE (UNCORRECTED)	SP. GR.	SP. GR. (CORRECTED) MG. F/L URINE
6118	1	0.65	1.007	0.65
6119	2	0.60	1.014	1.0
6120	3	2.6	1.024	2.6
6121	4	2.3	1.022	2.6
6122	5	1.4	1.017	2.0
6123	6	0.84	1.021	0.95
6124	7	0.75	1.022	0.81
6125	8	0.60	1.024	0.60
6126	9	1.4	1.026	1.3
6127	10	5.9	1.022	6.4
6128	11	1.1	1.024	1.1
6129	12	1.1	1.018	1.5
6130	13	0.47	1.020	0.56
6131	14	2.5	1.021	2.8
6132	15	1.7	1.030	1.4
6133	16	1.6	1.018	2.2
6134	17	1.3	1.019	1.6
6135	18	4.4	1.027	4.0
6136	19	2.0	1.028	1.7
6137	20	*	*	*
6138	21	0.96	1.024	0.96
6139	22	1.1	1.026	1.0
6140	23	3.4	1.024	3.4
6141	24	0.54	1.015	0.86
6142	25	0.70	1.019	0.88
6143	26	1.0	1.022	1.1
6144	27	2.4	1.028	2.0
6145	28	2.2	1.029	1.8
6146	29	1.5	1.026	1.4
6147	30	5.2	1.025	5.0
6148	31	1.2	1.028	1.0
6149	32	2.1	1.025	2.0
6150	33	2.1	*	2.1
6151	34	1.7	1.026	1.6
6152	35	3.8	*	3.8
6153	36	No Sample	-	-
6154	37	1.2.	1.019	1.5
6155	38	5.7	1.028	4.9
6156	39	0.66	1.027	0.59
6157	40	3.4	1.026	3.1
6158	41	1.2	1.024	1.2
6159	42	0.82	1.023	0.86
6160	43	1.4	1.021	1.6
6161	44	7.1	1.034	5.0
6162	45	3.4	1.025	3.3

*Insufficient Sample

ANACONDA ALUMINUM REDUCTION WORKS - Cont.

LAB #	FIELD #	MG. F/L URINE	SP. GR.	SP. GR. (CORRECTED) MG. F/L URINE
6163	46	1.2	1.025	1.2
6164	47	1.4	1.026	1.3
6165	48	2.3	1.025	2.2
6166	49	1.2	*	1.2
6167	50	4.0	1.032	3.0
6168	51	2.2	1.026	2.0
6169	52	2.8	1.031	2.1
6170	53	2.3	1.023	2.4
6171	54	0.71	1.026	0.66
6172	55	4.2	1.024	4.2
6173	56	1.6	1.024	1.6
6174	57	3.7	1.027	3.3
6175	58	1.1	1.025	1.1
6176	59	4.4	1.025	4.2
6177	60	3.8	1.019	4.8
6178	61	2.5	1.023	2.6
6179	62	4.9	1.032	3.7
6180	63	2.9	1.023	3.0
6181	64	0.77	1.018	1.0
6182	65	1.6	1.024	1.6
6183	66	2.0	1.021	2.2
6184	67	0.87	1.028	0.74
6185	68	2.1	1.023	2.2
6186	69	2.2	1.029	1.8
6187	70	2.4	1.027	2.1
6188	71	7.1	1.024	7.1
6189	72	2.6	1.026	2.4
6190	73	2.8	1.027	2.5
6191	74	3.4	1.033	2.5
6192	75	2.3	1.025	2.2
6193	76	3.3	1.029	2.8
6194	77	2.8	1.024	2.8
6195	78	2.1	1.027	1.9
6196	79	2.4	1.029	2.0
6197	80	1.8	1.028	1.5
6198	81	5.4	1.024	5.4
6199	82	0.75	1.030	0.60
6200	83	2.2	1.020	2.7
6201	84	6.8	1.028	5.8
6202	85	1.6	1.012	3.1
6203	86	0.40	1.019	0.50
6204	87	3.1	1.022	3.4
6205	88	0.54	1.018	0.72
6206	89	2.4	1.026	2.2
6207	90	0.96	1.027	0.86
6208	91	1.6	1.017	2.2
6209	92	2.2	1.036	1.5
6210	93	1.8	1.023	1.8
6211	94	2.4	1.020	2.9

*Insufficient Sample

ANACONDA ALUMINUM REDUCTION WORKS - Cont.

LAB #	FIELD #	MG. F/L URINE	SP. GR.	SP. GR. (CORRECTED) MG. F/L URINE
6212	95	1.7	1.018	2.2
6213	96	1.8	1.022	2.0
6214	97	8.0	1.027	7.1
6215	98	2.7	1.027	2.4
6216	99	0.86	*	0.86
6217	100	5.3	1.029	4.4
6218	101	1.8	1.031	1.5
6219	102	0.90	1.024	0.90
6220	103	1.2	1.019	1.5
6221	104	0.51	1.008	0.51
6222	105	0.42	1.019	0.53
6223	106	2.1	*	2.1
6224	107	1.7	1.022	1.8
6225	108	0.73	1.025	0.70
6226	109	0.50	1.025	0.48
6227	110	1.9	1.026	1.8
6228	111	1.9	1.022	2.1
6229	112	1.3	1.022	1.4
6230	113	0.43	1.024	0.43
6231	114	1.8	1.017	2.5
6232	115	0.53	1.013	0.98
6233	116	1.8	1.028	1.5
6234	117	1.1	1.021	1.3
6235	118	7.1	1.027	6.4
6236	119	1.7	1.026	1.6
6237	120	1.8	1.023	1.9
6238	121	0.52	1.021	0.59
6239	122	1.5	0.121	1.7
6240	123	0.44	1.023	0.46
6241	124	0.52	1.022	0.56
6242	125	0.28	1.012	0.55
6243	126	2.9	1.029	2.4
6244	127	4.3	1.031	3.3
6245	128	0.63	1.022	0.68
6246	129	0.77	1.024	0.77
6247	130	3.9	1.021	4.5
6248	131	1.7	1.023	1.8
6249	132	1.6	*	1.6
6250	133	0.66	1.025	0.64
6251	134	0.36	1.019	0.45
6252	135	0.47	1.031	0.36
6253	136	1.6	1.024	1.6
6254	137	11.	*	11.

*Insufficient Sample

TABLE 3-A - INFORMATION TO ACCOMPANY TABLE 3

ANACONDA ALUMINUM COMPANY

FIELD NUMBER	
1	Potman - coming on 2nd day shift.
2	Mechanic - coming on 2nd day shift.
3	Pot Reline - going off shift after 1 day.
4	Anode Repair - going off shift after 1 day.
5	Potman - after 1 day off.
6	Mechanic - home after 1 day shift.
7	Parts man garage - home after 1 day shift.
8	Laborer Casting - off shift after 7 shifts.
9	Laborer Casting - off shift after 7 shifts.
10	Pot Reline - going off shift after 1 day.
11	Utilityman - going on 6th night shift.
12	Utilityman - on shift after 1 day off.
13	Fabrication Shop - on after 2 days off.
14	Hot Metal Driver - on after being off 1 day.
15	Casting Fireman - going on 6th shift
16	Potman - on after 5 days off.
17	Pin Repair - on after 2 days off.
18	Pot Reline - home after 1 day shift.
19	Potman - on after 4 days off.
20	Potman - going on 6th shift
21	Waste Treatment Operator - 1 day off.
22	Casting - going on 6th shift.
23	Anode Repair
24	Casting Inspector - going on 6th shift.

FIELD NUMBER	
25	Paste Plant Operator - going after 2 days off.
26	Potman - home after 5th shift.
27	Utilityman - going on 2nd shift.
28	Mechanic - going off 3rd shift.
29	Potman - going on 6th shift
30	Anode Repair - going home after 1st shift.
31	Casting - off shift after 7th shift.
32	Potman - on after 1 day off.
33	Pot Reline - on after 1 day off.
34	Pipefitter - off after 1st day.
35	Ventilation Department - off after 1st day.
36	Welder - (Insufficient sample)
37	Electrician - off after 1st day.
38	Welder - home after 1st day on shift.
39	Welder - home after 1st day on shift.
40	Ventilation Department - home after 1st day on shift.
41	Pipefitter - home after 1st day on shift.
42	Welder - home after 1st day on shift.
43	Electrician - home after 1st day on shift.
44	Welder - home after 1st day on shift.
45	Potman - off shift after 7th shift.
46	Pin Puller - off shift after 7th shift.
47	Casting - off shift after 7th shift.
48	Ore Trench Operator - off shift after 7th shift.
49	Potman - off shift after 7th shift.

FIELD NUMBER	
50	Laborer - off shift after 7th shift.
51	Utilityman - off shift after 7th shift.
52	Union Vice President - off shift after 7th shift.
53	Off after 3rd shift.
54	Millwright - off shift after 7th shift.
55	Potman - off shift after 7th shift.
56	Laborer - off shift after 7th shift.
57	Potman - off shift after 7th shift.
58	Skirt Crew - off shift after 7th shift.
59	Laborer - off shift after 7th shift.
60	Potman - off shift after 7th shift.
61	Laborer - off shift after 7th shift.
62	Laborer - off shift after 7th shift.
63	Crucible Cleaner - off shift after 7th shift.
64	Millwright - off shift after 7th shift.
65	Welder - home after 1st day.
66	Welder - home after 1st day.
67	Pipefitter - home after 1st day.
68	Electrician - home after 1st day.
69	Potman - home after 1st day.
70	Welder - home after 1st day.
71	Potman - off shift after 7th shift.
72	Potman - off shift after 7th shift.
73	Potman - off shift after 7th shift.
74	Pin Puller - off shift after 7th shift.

Table 3-A - Continued

FIELD NUMBER	
75	Pin Puller - off shift after 7th shift.
76	Hot metal man - off shift after 7th shift.
77	Casting - off shift after 7th shift.
78	Briquetts - off shift after 7th shift.
79	Potman - off shift after 7th shift.
80	Potman - off shift after 7th shift.
81	Laborer - off shift after 7th shift.
82	Ore Trencher - off shift after 7th shift.
83	Potman - off shift after 7th shift.
84	Potman - off shift after 7th shift.
85	Pin Puller - off shift after 7th shift.
86	Paste Plant - 2 days off - going on shift.
87	Pin Puller - going on 6th shift.
88	Mechanic - going on 6th shift.
89	Potman - going on 6th shift.
90	Electrician - going on 6th shift.
91	Potman - going on 6th shift.
92	Potman - going on 6th shift.
93	Pot Reline - going on shift 2nd day.
94	Pin Puller - going on 6th shift.
95	Pin Puller - going on 6th shift.
96	Millwright - going on shift 2nd day.
97	Pot Reline - off after 1st day.
98	Pot Reline - off after 2nd day.
99	Pin Puller - off after 3rd day.

FIELD NUMBER	
100	Pot Control - going on 4th shift.
101	Potman - on after 2 days off.
102	Welder - going on 4th shift.
103	Mechanic - going on 3rd shift.
104	Potman - going on 2nd shift.
105	Pin Sander - 1st shift.
106	Potman - 3rd shift.
107	Skirt Crew - 4th shift.
108	Pipefitter - 4th shift.
109	Welder - off 2nd shift.
110	Anode Repair - 5th shift.
111	Potman - 1st shift after 2 days off.
112	Mechanic - 2nd shift.
113	Tapper - 1st shift after 3 days off.
114	Maintenance - on 4th shift.
115	Potman - off after 1 day at work.
116	Tapper - on 4th shift.
117	Tapper - on 1st shift after 2 days off.
118	Utilityman - on 4th shift.
119	Laborer - on 4th shift.
120	Potman - on 4th shift.
121	Syphon Cleaner - on after 4 days off.
122	Tapper - back after one month vacation.
123	Casting - on 2nd shift.

FIELD NUMBER	
124	Casting - on after 3 days off.
125	Casting - 1 day at work.
126	Potman - on 4th shift.
127	Pot Reline - 3rd day.
128	Potman - on after 2 days off.
129	Pin Puller - on after 3 days off.
130	Laborer - 3 days at work.
131	Pot Reline - 4 days at work.
132	Laborer - on after 2 days off.
133	Potman - off after 3 days on shift.
134	Machinist - 1 day on shift.
135	Laborer - on after 4 days off.
136	Potman - on after 2 days off.
137	Jack Slipper - on after 2 days off.

TABLE 4

NOISE MEASUREMENTS AND CRITERIA

MEASUREMENTS:

Location	Sound Level dBA	Comments
Pot rebuild area	102	All hammers operating
Ore truck	90-100	93 most often
Crust breaker	to 112	
At scale house:		
No traffic	86	
When trucks in area	90	
Hot metal transfer truck No. 513	98 Average	
Cathode rebuild area:		
North end of pot	102	8 hammers operating
Southeast corner of pot	102	8 hammers operating
----------	90	About 50 feet from above area
Forge in machine shop	100	
Anode repair	112	During "buckling up" anode
Compressor room - boiler house	85-89	
Compressor room - boiler house office	64	With door closed
Paste plant between ball mills	115	
Paste plant general area	108	

TABLE 4 - Continued

Permissible Noise Exposures:

Duration Per day Hours	Sound Level dBA[a)]
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
3/4	107
1/2	110
1/4	115-C[b)]

1. Guides for the Evaluation of Hearing Impairment. Transactions of the American Academy of Ophtalmology and Otolaryngology, pp. 167-8 (March-April 1959).

2. Guides to the Evaluation of the Permanent Impairment; Ear, Nose, Throat, and related Structures. Journal of the American Medical Association 197:489 (August 1961).

a) Sound level in decibels as measured on a standard level meter operating on the A-weighting network with slow meter response.

b) Ceiling Value.